

### **REMARKS/ARGUMENTS**

Favorable reconsideration of this application in light of the following discussion is respectfully requested.

Claims 1-5, 11-15 and 21-22 are pending in this application. No claim amendments are presented, thus, no new matter is added.

In the outstanding Office Action, Claims 1-4 and 11-14 were rejected under 35 U.S.C. 103(a) as unpatentable over Strobel (U.S. Patent No. 6,650,724) in view of Mullick et al. (U.S. Patent No. 7,123,760, hereinafter Mullick); Claims 5 and 15 were rejected under 35 U.S.C. §103(a) as unpatentable over Strobel in view of Mullick in further view of Buzug et al. (U.S. Patent No. 5,956,435, hereinafter Buzug); and Claims 21 and 22 were rejected under 35 U.S.C. §103(a) as unpatentable over Strobel in view of Mullick and in further view of Klotz et al. (U.S. Patent No. 6,845,142, hereinafter Klotz).

Applicant respectfully requests reconsideration of the rejection under 35 U.S.C. §103(a), and traverses the rejection, as discussed next.

Applicant's independent Claim 1 relates to a 3D image processing apparatus, comprising:

a storing unit configured to store data of a plurality of mask images corresponding to a plurality of projection directions associated with an object to be examined, and data of a plurality of contrast images corresponding to the plurality of projection directions associated with the object;

a first subtracting unit configured to generate data of a plurality of subtraction images by subtracting the plurality of mask images from the plurality of contrast images;

a reconstruction unit configured to reconstruct first volume data from the plurality of contrast images and configured to reconstruct second volume data from the plurality of subtraction images;

***a second subtracting unit configured to generate mask volume data by subtracting the second volume data from the first volume data,***

an image processing unit configured to generate data of a first 3D image representing a bone structure and/or a soft

tissue structure from the mask volume data, and configured to generate data of a second 3D image representing a contrasted blood vessel from the second volume data...

Independent Claim 11 recites substantially similar features. Accordingly the arguments presented below are applicable to each of independent Claims 1 and 11.

The outstanding Office Action admits that Strobel fails to teach or suggest “a second subtracting unit configured to generate mask volume data by subtracting second volume data containing vessels, from first volume data containing both bone structures and enhanced vessels...” In an attempt to remedy this deficiency, the Office Action relies on Mullick and states that it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the cited references to arrive at Applicant’s claims. Applicant respectfully traverses this rejection, as Mullick fails to teach or suggest the claimed features for which it is asserted as a secondary reference under 35 U.S.C. §103

Mullick describes a technique for automatically identifying regions of bone or other structural regions within a reconstructed CT volume data set.<sup>1</sup> The technique identifies and labels regions within the data set and computes various statistics for the regions, and a rule-based classifier processes the statistics to classify each region. A structure mask, such as a bone mask, is then constructed after exclusion of regions of interest, and may be used to construct a volume rendering free of the structure, such as bone-free.

Mullick, however, fails to teach or suggest the *second subtracting unit*, as recited in independent Claim 1, *configured to generate mask volume data by subtracting the second volume data from the first volume data*, wherein the second volume data is constructed from the plurality of subtraction images (contrast images-mask images), and the first volume data is constructed from the contrast images.

---

<sup>1</sup> Mullick, Abstract.

In addressing this claimed feature, the Office Action cites col. 13, lines 54-58 of Mullick. This cited portion of Mullick describes that a bone mask may be shown in varying degrees of opacity and translucence, and that an operator may use the presence of a mask structure to provide orientation and location information. Once oriented, the mask may be excluded to examine the structures of interest, and in addition to configuring the translucence or opacity of the mask, the operation may be provided with the ability to increase or decrease intensity to generate the desired rendering. Thus, Mullick simply describes a process of using the bone mask as a frame of reference and modifying the display of the bone mask, but fails to teach or suggest generating data of a first 3D image representing a bone structure and/or a soft tissue structure by performing the operation of the second subtraction unit, as noted above.

Specifically, Claim 1 recites that the second subtraction unit is configured to generate mask volume data, which is used to generate data of a first 3D image representing a bone structure and/or a soft tissue structure, by subtracting second volume data (i.e. volume data generated from the plurality of mask images subtracted from the plurality of contrast images) from the first volume data (i.e. volume data generated from the plurality of contrast images).

The cited portion of Mullick fails to teach or suggest this claimed feature, but instead describes how the bone mask may be displayed in varying degrees in opacity or translucence by adding or removing the bone mask from the display. Such a procedure has nothing to do with the creation of the bone mask itself, as recited in independent Claim 1.

Therefore, Applicant respectfully submits that Strobel and Mullick, neither alone, nor in combination, teach or suggest the *second subtracting unit*, as recited in independent Claim 1, *configured to generate mask volume data by subtracting the second volume data from the first volume data*, wherein the second volume data is constructed from the plurality of

subtraction images (contrast images-mask images), and the first volume data is constructed from the contrast images.

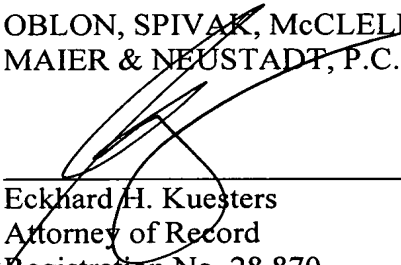
Accordingly, Applicant respectfully requests that the rejection of Claim 1 (and Claims 2-5 and 21 which depend therefrom) under 35 U.S.C. §103 be withdrawn. For substantially similar reasons, it is also submitted that independent Claim 11 (and Claims 12-15 and 22, which depend therefrom) also patentably define over Strobel and Mullick.

Further, the Buzug and Klotz references, relied upon by the outstanding Office Action to form a 35 U.S.C. §103(a) rejection of the dependent claims, does also not remedy the deficiencies of Strobel and Mullick. Therefore, Applicant respectfully traverses the rejection of the dependent claims, and requests reconsideration of the rejection.

Consequently, in view of the present amendment, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for formal Allowance. A Notice of Allowance for Claims 1-5, 11-15 and 21-22 is earnestly solicited.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,  
MAIER & NEUSTADT, P.C.



---

Eckhard H. Kuesters  
Attorney of Record  
Registration No. 28,870

Customer Number  
**22850**

Tel: (703) 413-3000  
Fax: (703) 413 -2220  
(OSMMN 06/04)

Andrew T. Harry  
Registration No. 56,959